



## Gastroesophageal reflux disease (GERD): an overview and considerations for the dental practitioner

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### Introduction

GERD is a common condition classically defined as the abnormal reflux of gastric contents into the esophagus producing mucosal damage or chronic symptoms. The total healthcare costs of GERD are high, and medications used to treat symptoms are expensive (1).

Although there is no gender predilection for GERD, the typical symptoms of heartburn (pyrosis) and acid regurgitation affect 20% or more of American adults. These symptoms significantly impair quality of life and are among the most common complaints encountered by primary care physicians (2, 3).

### Etiology

GERD has a multifactorial etiology; contributing factors include refluxate causticity, breakdown in defense mechanisms of the esophagus and incompetent barrier function at the gastroesophageal junction. The normal antireflux mechanism relies on the muscular activity of the lower esophageal sphincter (LES) and the diaphragm, which, acting together, block the upward flow of acidic stomach contents into the esophagus. A sustained or transient decrease in LES tone results in lost gradient of pressure and reflux of acidic substances into the esophagus. Duration of exposure is a key factor in determining the extent of tissue damage (4).

### Clinical Presentation

Many of the symptoms of GERD are the result of mucosal injury to the lining of the esophagus (5). Heartburn and regurgitation are the cardinal symptoms that normally lead a patient to seek diagnosis and treatment (6). Heartburn is described as a deep burning sensation originating in the abdomen and rising to the chest or neck. Regurgitation is the backward flow of undigested food. Dysphagia, or difficulty swallowing, is a less common symptom (3, 7).

Other manifestations of GERD include persistent cough, sore throat, asthma, recurrent aspiration, laryngitis, laryngospasm, nausea, sinusitis, pneumonitis, hiccups and dental erosion. There appears to be a relationship between asthma and GERD, but the precise mechanism is unclear (3, 6).

Complications that arise with long-term untreated GERD include strictures, ulcerations and Barrett's esophagus (BE). BE occurs when the distal eroded squamous mucosa is replaced by metaplastic gastric epithelium. This worrisome premalignant condition affects up to 10% of GERD sufferers and puts them at increased risk of developing adenocarcinoma of the esophagus. Periodic endoscopic biopsy is necessary to assess neoplastic tissue changes in those at risk (3, 8).

### Diagnosis

Preliminary diagnosis of GERD is usually straightforward and made from the characteristic symptoms of heartburn and regurgitation. Patients are initially treated with a proton pump inhibitor (PPI) for two weeks. If symptoms respond favorably, a definitive diagnosis of GERD is made. Twenty-four hour intraesophageal pH monitoring is considered the "gold standard" for GERD diagnosis. However, the two-week trial with a PPI is as sensitive and specific and more cost-effective than intraesophageal monitoring (6). Endoscopy is not sensitive for diagnosis of GERD itself (fewer than 50% of patients have evidence of esophagitis on endoscopy), but it is useful for diagnosing complications of GERD, such as BE and strictures (4, 6).

### Medical Management

Therapy for GERD focuses on decreasing contact time of the refluxate with the distal esophagus. The goal is to alleviate symptoms and promote esophageal healing. Mainstay treatment modalities have traditionally involved lifestyle modification and pharmacologic intervention. Despite the lack of clinical data to support the effectiveness of lifestyle changes as sole therapy, GERD patients do experience relief from symptoms by incorporating these changes into their normal routine. Avoiding consumption of fatty foods, tomato-based foods, peppermint, chocolate, caffeinated products, citrus fruits, colas, red wine and alcohol may reduce reflux. Additionally, avoiding large meals, not eating within 3 hours of bedtime, and elevating the head of the bed six inches may be beneficial. Lozenges may reduce symptoms since they stimulate saliva secretions and help wash down the refluxate. Other recommended lifestyle changes include weight loss and smoking cessation.

Medications for the treatment of GERD include antacids, histamine-2 receptor antagonists ( $H_2$ RAs) and PPIs. Over the counter (OTC) antacids provide prompt but transient relief of mild symptoms. These agents are often consumed in large doses to reduce symptoms, but adverse effects (chalky taste, constipation, stomach cramps, nausea, vomiting) can result. Antacids are not as effective as acid suppressants in the management of GERD (3, 6).

$H_2$ RAs are 60-70% effective in relieving symptoms when used alone. When combined with antacids, effectiveness is increased to 81%. Tolerance can develop with prolonged use of these medications.  $H_2$ RAs exert their effect by blocking histamine stimulation of stomach parietal cells to produce acid (6). These agents became available over the counter in 1995 and are used widely. The  $H_2$ RAs currently available are:

- Cimetidine (Tagamet)
- Famotidine (Pepcid)
- Nizatidine (Axiid)
- Ranitidine (Zantac) (3).

PPIs irreversibly inhibit the  $H^+-K^+$  adenosine triphosphate pump of parietal cells and strongly reduce gastric acid secretion. Studies have shown that they provide superior symptom control, esophageal healing and maintenance of remission more than any other drug class used to treat GERD (6). Currently available PPIs are:

- Esomeprazole magnesium (Nexium)
- Lansoprazole (Prevacid)
- Omeprazole (Prilosec) \*Available OTC
- Pantoprazole sodium (Protonix)
- Rabeprazole sodium (Aciphex) (3, 9).

The once popular promotility drug cisapride (Propulsid), used to treat severe nighttime GERD, was taken off the market in July 2000 after FDA reports linked the drug to dozens of fatal heart rhythm abnormalities. Its use is currently restricted to those patients with intractable symptoms who meet certain clinical eligibility criteria (10).

A "stepped care" approach to managing GERD has been advocated whereby patients with mild or sporadic symptoms should put into action appropriate lifestyle changes and be treated with antacids or  $H_2$ RAs, as needed. The regimen can be "stepped up" to PPI therapy if symptoms worsen and become more frequent. Patients with severe symptoms should start PPI therapy from the outset (3).

Antireflux surgical procedures are available and can be useful in certain patients who continue to have symptoms despite maximum medical therapy (9).

## Dental Management

Dentists are often the first healthcare providers to identify GERD because of the oral manifestation of dental erosion. It is critical that any type of tooth wear be documented and investigated upon clinical examination. Wear can result from attrition, abrasion, abfraction, erosion or any combination of these. In GERD, dental erosion is noted on tooth surfaces that come in contact with refluxed acidic stomach contents. The areas typically affected are the occlusal surfaces of posterior teeth, the lingual aspect of maxillary anterior teeth and the buccal surfaces of the mandibular posterior teeth. "Floating" amalgam restorations, shiny dentin and irregular occlusal surfaces that prevent accurate hand-articulation of casts are common findings. Patients may complain of thermal or sweet sensitivity if dentin is exposed (11).

The observation of erosion should prompt an investigation as to the causative agent. Unless the patient admits to a highly acidic diet, which can be modified without medical intervention, a physician referral should be made (12). Some GERD sufferers are called "silent refluxers" because the common symptoms of heartburn or regurgitation are not present, and these individuals are often unaware of their condition (13).

In the absence of any other dental disease, restorative care should consist of palliative treatment with dentin bonding agents, sealants, fluoride trays or alkaline mouthwashes to decrease sensitivity until a diagnosis is made and effective medical treatment commenced. If a patient is aware of gastric reflux but has not been diagnosed, a splint filled with magnesium hydroxide, sodium bicarbonate or fluoride inserted at high-risk times may protect the tooth structure until diagnosis and treatment (14). Oral hygiene instructions should be given at the initial appointment and reevaluated at subsequent visits. Once GERD is under control, definitive restorative treatment may begin.

If wear is mild to moderate, conservative restoration of natural tooth contours with appropriate restorative material is recommended. A classic article by Turner and Missirlian discusses treatment of patients with excessive wear. Assessment of vertical dimension of occlusion (VDO) is key in determining the appropriate treatment for these individuals. Evaluation of posterior tooth support, wear history, phonetics, interocclusal distance and facial appearance allows categorization of patients into one of three groups:

1. Excessive wear with loss of VDO
2. Excessive wear without loss of VDO and available space for restorative materials
3. Excessive wear without loss of VDO and inadequate space for restorative materials.

For category 1 patients it is recommended that a removable overlay splint be worn for 6-8 weeks to test the proposed VDO prior to restoration. Category 2 patients may require crown lengthening prior to restoration to attain adequate clinical crown height for retention and resistance form. Patients in category 3 usually require the most extensive and multidisciplinary approach. Orthodontics and/or surgical treatment in combination with prosthetics are usually necessary in these challenging cases (12).

After treatment, it is critical for these patients to continue follow-up with the physician and dentist to assess level of disease control and oral health status. The patient must understand that unrestored tooth surfaces will be affected if reflux recurs or if hygiene is neglected.

## Conclusion

GERD is a common disease that significantly impacts patients' quality of life. Heartburn and regurgitation are the cardinal features, but manifestations are variable. Pharmacologic therapy to reduce gastric acid secretion remains the mainstay of GERD treatment. The key to dental management of patients suffering from GERD is correct diagnosis and effective medical treatment prior to dental restoration of eroded tooth surfaces. Frequent medical and dental recall is imperative for these individuals.

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